Space Weather Forecast

Issued on Sunday, 30 July 2023 at 01:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: R1-R2 Blackouts likely throughout. G1-G2 Minor/Moderate storms possible 01 Aug with CME arrival. S1/Moderate Radiation Storm gradually easing.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Moderate, with one Moderate-class flare from a region in the south centre disc. This is one of two complex regions on the visible disc, with a further complex region in the northeast quadrant. There are 11 sunspot regions on the solar disc in total, with many appearing weak or inactive. However a number of regions towards the eastern limb have not yet been fully analysed due to their location. Activity is also evident from beyond the eastern limb, with the source of this expected to become apparent through the period.

One Earth-directed coronal mass ejection (CME) was observed early on 29 Jul. No other Earth-directed CMEs have been observed.

Solar Wind / Geomagnetic Activity: The solar wind was mainly at background levels, with a slight increase to slightly elevated levels at the end of the period, due to a possible connection to a weak, but faster solar wind source on the Sun. Total magnetic field strength increased from weak to moderate levels at the same time. The north-south component only varied weakly. Total geomagnetic activity was Quiet to Unsettled.

Energetic Particles / Solar Radiation: The observed count rate of energetic particles (high energy protons) rose due to the energetic far-sided eruption, above the S1 level late on 28 Jul, peaking at S2 Moderate Radiation storm levels early on 29 Jul, These have now returned to S1/Minor Storm levels and plateaued.

Solar Activity: Low to Moderate activity is forecast, with a very slight chance of Strong activity.

Solar Wind / Geomagnetic Activity: A CME which left the Sun early on 29 Jul is forecast to arrive at Earth on 01 Aug. No further Earth-directed CMEs are forecast. An enhanced solar wind, from an unidentified feature appears to be affecting the Earth, with effects expected to decline during 30 Jul. Quiet with isolated Unsettled geomagnetic activity expected through 30 and 31 Jul. Activity then expected to reach peaks of Active or G1.Minor Storm during 01 Aug due to the CME arrival, with residual impact then possible into 02 Aug. there is also a slight chance of G2/Moderate Storms.

Energetic Particles / Solar Radiation: The count rate of energetic particles is likely to remain above the S1 Minor Storm level for much of the period, showing only a gradual decline. A more notable decline is likely on day 4 (01 Aug) after the CME arrival.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	10	60	30
Strong	G3	No	1	1	10	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	70	70	60	60
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	Yes	100	90	70	60
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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